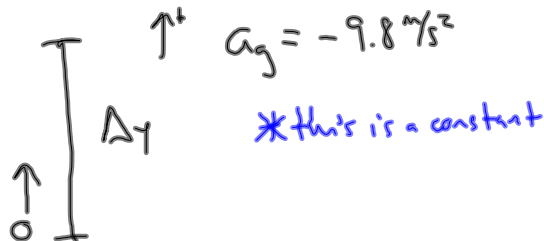


Quarter Exam:

- Kinematics
 - 1-D
 - Projectile Motion
- Momentum
- Forces

Kinematics:

- Something in motion
- Variables: S time
 - $S = \text{scalar}$ V velocities (initial, final)
 - $v = \text{vector}$ V accelerations
(x-direction, gravity)
 - V displacements
(x- or y-directions)
- Vector: quantity with magnitude and direction
- Scalar: quantity with just a magnitude
($+/-$ means increase/decrease)
- Adding vectors: You cannot simply add them unless they are in the same direction. If they are different directions, then you have to use triangles.
- y-direction \rightarrow throw object upwards



$$\Delta x = v_{ix}t + \frac{1}{2}a_xt^2$$

$$v_{fx} = v_{ix} + a_xt$$

$$v_{fx}^2 = v_{ix}^2 + 2a_x\Delta x$$

$$\Delta y = v_{iy}t + \frac{1}{2}a_yt^2$$

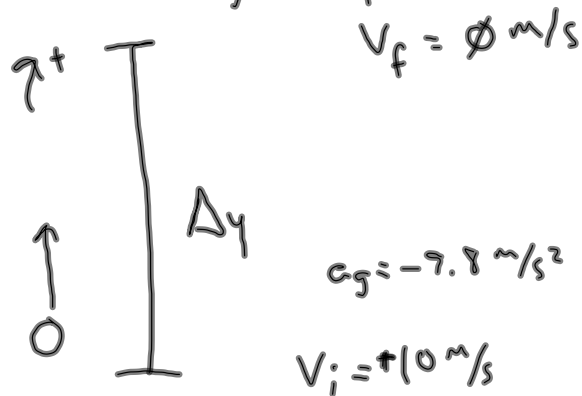
$$v_{fy} = v_{iy} + a_yt$$

$$v_{fy}^2 = v_{iy}^2 + 2a_y\Delta y$$

A person throws a ball upwards at 10 m/s .

a) How high does it travel?

b) How long does it take to reach the highest point?



$$a) \quad V_{fy}^2 = V_{iy}^2 + 2a_g \Delta y$$

$$\Delta y = \frac{-V_{iy}^2}{2a_g}$$

$$= 5.10 \text{ m}$$

$$b) \quad V_{fy} = V_{iy} + a_g t$$

$$t = \frac{-V_{iy}}{a_g}$$

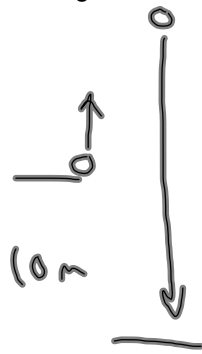
$$= 1.02 \text{ s}$$

Quarter Exam Review 3.16.12 Honors Physics

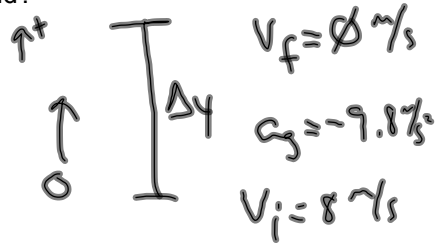
A person standing on a balcony at 10 m throws a ball upwards at a velocity of 8 m/s.

a) How high does the object go above the 10 m starting point?

b) How long does it take for the ball to hit the ground?



a)



$$\Delta y = \frac{-V_{iy}^2}{2a_g}$$

$$= 3.27 \text{ m}$$

$$t_{up} = \frac{-V_{iy}}{a_g} = 0.816 \text{ s}$$

b) total time = $t_{up} + t_{down}$

$$= 0.816 \text{ s} + 1.65 \text{ s}$$

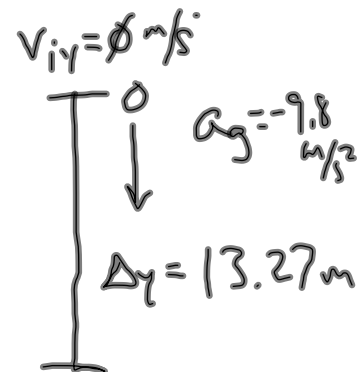
$$= 2.46 \text{ s}$$

$$\Delta y = V_{iy}t + \frac{1}{2}a_g t^2$$

$$t = \sqrt{\frac{2\Delta y}{a_g}}$$

$$= \sqrt{\frac{2(-13.27 \text{ m})}{(-9.8 \text{ m/s}^2)}}$$

$$= 1.65 \text{ s}$$



Graphing:

